

[0076] The use of the first and second embodiments being disclosed above for the relative positioning method is presented next. This is done in two parts: First, the radio fingerprint information is collected from all of the devices using the first embodiment. Second, the user feedback is obtained using the second embodiment.

[0077] FIG. 11 shows an example how the radio fingerprint information is distributed between all devices. FriendlyNames of the devices indicate the signal strength the other devices being obtained by scanning the devices (i.e. first iteration). It is to be noticed that instead of the signal strength also motion mode of embodiment 2 can be indicated according to following steps:

[0078] Device 1 FriendlyName: "D1:D2 -50 dBm, D3 -80 dBm"

[0079] Device 2 FriendlyName: "D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm"

[0080] Device 3 FriendlyName: "D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm"

[0081] Device 4 FriendlyName: "D4:D2 -71 dBm, D3 -49 dBm"

[0082] During the second iteration, each device modifies its own FriendlyName by information being received from the FriendlyName of another device that is being heard by the device in question, for example, the FriendlyName of Device 1 is appended with information obtained from FriendlyName of Device 2 and Device 3. Modified FriendlyNames are as follows (added information is **bolded**):

[0083] Device 1 FriendlyName: "D1:D2 -50 dBm, D3 -80 dBm|D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm"

[0084] Device 2 FriendlyName: "D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm|D1:D2 -50 dBm, D3 -80 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm D4:D2 -71 dBm, D3 -49 dBm"

[0085] Device 3 FriendlyName: "D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm|D1:D2 -50 dBm, D3 -80 dBm D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D4:D2 -71 dBm, D3 -49 dBm"

[0086] Device 4 FriendlyName: "D4:D2 -71 dBm, D3 -49 dBm|D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm"

[0087] During the third information, each device modifies its own FriendlyName further by adding the missing (not being seen during the second iteration) information being obtainable from the other devices' FriendlyName. In this example, FriendlyName of Device 1 is modified to include also signal strength of Device 4 and vice versa follows (added information is **bolded**):

[0088] Device 1 FriendlyName: "D1:D2 -50 dBm, D3 -80 dBm|D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm|D4:D2 -71 dBm, D3 -49 dBm"

[0089] Device 2 FriendlyName: "D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm|D1:D2 -50 dBm, D3 -80 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm D4:D2 -71 dBm, D3 -49 dBm"

[0090] Device 3 FriendlyName: "D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm|D1:D2 -50 dBm, D3 -80 dBm D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D4:D2 -71 dBm, D3 -49 dBm"

[0091] Device 4 FriendlyName: "D4:D2 -71 dBm, D3 -49 dBm|D2:D1 -48 dBm, D3 -53 dBm, D4 -75 dBm D3:D1 -74 dBm, D2 -53 dBm, D4 -55 dBm|D1:D2 -50 dBm, D3 -80 dBm"

[0092] In this example, after three iterations all devices know the Bluetooth signal strengths between all pairs of devices. It is appreciated that instead of the Bluetooth signal, also WLAN signal or other signal from other radio receivers can be used. In an embodiment, after the radio fingerprint information has been collected, we need to collect user feedback, from one user at a time, to obtain more reliable positioning. This is explained next. No more fingerprint information needs to be collected.

[0093] FIG. 11 is again used for user feedback collection. Now, Device 1 has been selected as the device which does the positioning calculations and is the one that initiates the asking of user feedback for device 3.

[0094] First iteration: Device 1 initiates query for device 3 position:

[0095] Device 1 FriendlyName: "Request position for device 3, iteration 1"

[0096] Device 2 FriendlyName: ""

[0097] Device 3 FriendlyName: ""

[0098] Device 4 FriendlyName: ""

[0099] Second iteration: Request is passed to devices 2 and 3 (device 4 cannot see request yet):

[0100] Device 1 FriendlyName: "Request position for device 3, iteration 1"

[0101] Device 2 FriendlyName: "Request position for device 3, iteration 1"

[0102] Device 3 FriendlyName: "Request position for device 3, iteration 1"

[0103] Device 4 FriendlyName: ""

[0104] Third iteration: Device 3 sees request for its position and asks its user to input or indicate its position. After having the position, Device 3 updates its FriendlyName to reflect the obtained position. Device 4 finally sees request (from devices 2 and 3):

[0105] Device 1 FriendlyName: "Request position for device 3, iteration 1"

[0106] Device 2 FriendlyName: "Request position for device 3, iteration 1"

[0107] Device 3 FriendlyName: "Device 3 position (3, 1), iteration 1"

[0108] Device 4 FriendlyName: "Request position for device 3, iteration 1"

[0109] Fourth iteration: All devices see device 3 sharing its position. Device 1 notices the position and performs the positioning calculations again:

[0110] Device 1 FriendlyName: "Device 3 position (3, 1), iteration 1"

[0111] Device 2 FriendlyName: "Device 3 position (3, 1), iteration 1"

[0112] Device 3 FriendlyName: "Device 3 position (3, 1), iteration 1"

[0113] Device 4 FriendlyName: "Device 3 position (3, 1), iteration 1"

[0114] In the previous embodiments, no pairing or bonding is required, only a software that changes the "FriendlyNames" accordingly. This can be possibly used with other radio transmission systems/protocols as well—not only Bluetooth. Some known checksum method can be added to